Parametric plotting on TI-83/84 and TI-85/86 calculators

Most graphing calculators have a parametric plot mode. Directions for this mode are below for the TI-83/84 and on the next page for the TI-85/86. As example, the directions include specifics on plotting the curve described parametrically by

$$x = t^2 \qquad y = t^3 - t \qquad \text{for } -2 \le t \le 2$$

TI-83/84

1. To put your calculator in the parametric plotting mode, go to the `MODE` menu and select `Par` on the fourth line. (The options on this line are `Func Par Pol Seq`.)

2. Use `Y=` to get to the function entry screen. In parametric mode, this screen will have prompts labeled $\texttt{X}_{1\texttt{T}}$ and $\texttt{Y}_{1\texttt{T}}$. Enter the parametric relations at these prompts. For the example above, you would use

   $\texttt{X}_{1\texttt{T}}\texttt{=T}^2$
   $\texttt{Y}_{2\texttt{T}}\texttt{=T\^{}3-T}$

3. Once you have the parametric relations entered, you can hit `GRAPH`. You will probably need to adjust the parameter range. To do this, use `WINDOW` where you will be able to enter minimum and maximum values for t. For the example above, we use `Tmin=-2` and `Tmax=2`. You might also want to change the value of `Tstep`. If you use a relatively small value for `Tstep`, the calculator will plot more points and you will be better able to watch the progress as the curve is traced out. For the example above, the value `Tstep=0.01` works well. You might want to experiment with a big value (such as `Tstep=1`) and a small value (such as `Tstep=0.001`) to see why `Tstep=0.01` is a good choice for this example.

4. Generally, you will also want to adjust the window ranges for `X` and `Y`. For the example above, a reasonable choice might be `Xmin=-1`, `Xmax=5`, `Ymin=-7`, and `Ymax=7`.

TI-85/86

1. To put your calculator in the parametric plotting mode, go to the `MODE` menu (the `2nd` feature on the `MORE` button). Select `Param` on the fifth line. (The options on this line are `Func Pol Param DifEq`.)

2. Go to the `GRAPH` menu. The leftmost item at the bottom of the screen should read `E(t)=`. Select this to bring up the function entry screen which will have prompts `xt1=` and `yt1=`. Enter the parametric relations at these prompts. For the example above, you would use

   `xt1=t^2`

   `yt1=t^3-t`

   Note that the variable `t` is available as the leftmost item at the bottom of the screen.

3. Once you have the parametric relations entered, you can hit `GRAPH`. You will probably need to adjust the parameter range. To do this, use `WINDOW` where you will be able to enter minimum and maximum values for t. For the example above, we use `tMin=-2` and `tMax=2`. You might also want to change the value of `tStep`. If you use a relatively small value for `tStep`, the calculator will plot more points and you will be better able to watch the progress as the curve is traced out. For the example above, the value `tStep=0.01` works well. You might want to experiment with a big value (such as `tStep=1`) and a small value (such as `tStep=0.001`) to see why `tStep=0.01` is a good choice for this example.

4. Generally, you will also want to adjust the window ranges for `x` and `y`. For the example above, a reasonable choice might be `xMin=-1`, `xMax=5`, `yMin=-7`, and `yMax=7`.